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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/646,728	04/27/2001	Shahnaz Jammal	2762-113	6097

6449 7590 05/19/2004

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EXAMINER

NGUYEN, NGA B

ART UNIT PAPER NUMBER

3628

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/646,728

Applicant(s)

JAMMAL ET AL.

Examiner

Nga B. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7, 11</u> . | 6) <input type="checkbox"/> Other: _____  |

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### DETAILED ACTION

1. This Office Action is the answer to the communication filed on April 27, 2001, which paper has been placed of record in the file.
2. Claim 1-24 are pending in this application.

### ***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-17 are rejected under 35 U.S.C 101 because the claimed invention is directed to non-statutory subject matter, particularly, an abstract idea.

The claims, as presently claimed and best understood were reconsidered in light of the "Examination Guidelines for Computer-Related Inventions" and were found to be non-statutory. Discussion of the analysis of the claims under the guidelines follows.

Claims 1-17 merely manipulate an abstract idea that is not within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena) that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful arts" (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter.

As to claims 1-17, the invention is not implemented on a specific apparatus; therefore, the invention is not directed to the technological arts. To be statutory, the utility of an invention must be within the technological arts. The definition of

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"technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect." (Computer Dictionary 384 (Microsoft Press, 2d ed. 1994)). When one looks to the present specification to determine what the applicant has invented, the invention appears to be a series of steps performed on a computer. It is clear that claims 1-17 are intended to be directed to the abstract method apart from the apparatus for performing the method. Therefore, claims 1-17 are non-statutory, because they are directed solely to an abstract idea without practical application in the technological arts.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 8, 10, 11, 14, 16-21, 23, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Tom, U.S. Patent No. 5,832,465.

Regarding to claim 1, Tom discloses a method for assessing the risk of a borrower defaulting on a financial obligation within a predefined market, comprising the steps of:

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receiving a first input indicative of whether the borrower has previously defaulted on a financial obligation (column 4, lines 30-37; receiving bankruptcy indicator);

receiving a second input comprising a plurality of credit factors indicative of the ability of the borrower to repay a financial obligation in the predefined market (column 3, line 32-column 4, line 37; column 10, line 51-column 11, line 5; figures 7a, 7b, item "Variable"; receiving a plurality of linguistic evidential values as credit factors contain residence, employment, debt, credit, and miscellaneous)

determining, using the first input and the second input, a set of weights to be place on each of plurality of credit factors (column 4, lines 38-40; column 6, lines 28-31, 62-67; figures 7a, 7b, item "Input Nodes, Input"; column 9, lines 5-15; translating linguistic evidential values into numeric values using weighting function); and

calculating, using the plurality of credit factors and the set of weights, a probability of default for the borrower (column 11, lines 5-20; figures 7a, 7b, item "Output Node, Output"; calculating a credit worthiness or probability of default for the borrower using linguistic evidential values and numeric values).

Regarding to claims 2, 14, Tom discloses:

setting each of the set of weights to a pre-determined value (column 6, lines 27-37; figures 7a, 7b, item "Input Nodes, Input"; the numeric values have pre-determined values range between -1.0 and 1.0);

setting each of the plurality of credit factors to a randomly selected new value wherein the new value is within a percentage range of the previous value (column 9, lines 20-25);

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calculating, using the plurality of credit factors and the set of weights, a first probability of default for the borrower; measuring the first probability of default to determine a level of fitness; determining when the level of fitness is not a good fit; and setting each of the set of weights to a new calculated value when the determining the level of fitness is not a good fit (column 9, line 1-column 10, line 35; column 12, lines 6-13; optimizing the weighting function for each nodes until there is minimal error between the final output and the desired output, thus a first credit worthiness is calculated, the level of fitness is determined by error function, the credit worthiness is continuing calculated until minimizing error function).

Regarding to claim 3, Tom discloses the pre-determined value is zero (column 6, lines 27-37; figures 7a, 7b, item "Input Nodes, Input"; the numeric values have pre-determined values range between -1.0 and 1.0, thus it contains 0).

Regarding to claims 8, 17, Tom discloses using maximum likelihood estimation iteration to set each of the set of weights to the new calculated value (column 9, lines 40-45; column 12, lines 5-13).

Regarding to claim 10, Tom discloses graphically outputting the probability of default for the borrower (column 5, lines 15-33).

Regarding to claim 11, Tom discloses determining, using the first input, a level of predictive accuracy for the probability of default; determining, when the level of predictive accuracy satisfies a pre-determined threshold, whether the set of weights are unstable; generating, when the determining that the set of weights are unstable, a new of weights to be place on each of the plurality of credit factors; whereby the new set

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of weights are deemed sufficiently accurate and stable to be used as a basis for assessing the risk of default within the predefined market of different, new borrowers (column 9, line 1-column 10, line 35; column 12, lines 6-13; optimizing the weighting function for each nodes until there is minimal error between the final output and the desired output, thus a first credit worthiness is calculated, the level of fitness is determined by error function, the credit worthiness is continuing calculated until minimizing error function).

Regarding to claim 16, Tom discloses receiving a number of desired iterations input; performing a maximum likelihood estimation iteration the number of times, wherein each of the number of iterations produce a resulting set of weights; and using a stability process to select one of the number of the resulting set of weights (column 9, lines 40-45; column 12, lines 5-13).

Claims 18-19 are written in means that contains similar limitations found in claims 1, 10 above, therefore, is rejected by the same rationale. Moreover, Tom discloses a general database that contains a record for each borrower, wherein the record includes the corresponding one of the plurality of sets of weights, the plurality of first inputs, and the plurality of second inputs for each borrower (column 3, lines 48-50; column 10, lines 35-50; data storage unit 22).

Claims 20, 21, 23, 24 are written in computer software that parallel the limitations found in claims 1, 2, 10, 11 above, therefore, are rejected by the same rationale.

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4-7, 9, 12, 13, 15, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tom, U.S. Patent No. 5,832,465.

Regarding to claims 4, 9, 5, 12, Tom discloses using an equation to calculate a value indicative of the combination of the set of weights applied to the plurality of credit factors (column 7, line 12-column 8, line 51; evidence aggregation function); using the value as input into an equation to calculate the first probability of default for the borrower (column 9, line 1-column 10, line 35; weighting function); and using the first input and the first probability of default as inputs into an equation to determine the level of fitness (column 9, line 15-45; error function). Although Tom's equations having different structures, but they have the same purpose for calculating the combination of the set of weights (evidence aggregation function), calculating the first probability of default or credit worthiness for the borrower (weighting function), calculating the level of fitness (error function). Moreover, it is well known in the art to modify equations using for optimizing model. Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify Tom's equations in the optimizing model for the purpose of providing more efficiency for calculating the probability of default or credit worthiness for the borrower.



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Regarding to claim 6, Tom discloses determining whether the level of fitness can be minimized by more than a pre-determined amount (column 9, lines 40-45).

Regarding to claims 7, 13, 15, Tom does not disclose the level of fitness can be minimized by a pre-determined amount is  $10^{-7}$ ; the new value is within a percentage range is from 0% to 1% of the previous value. However, it is well known in the art to use different values in an equation. Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify Tom's to include the feature above in the optimizing model for the purpose of providing more efficiency for calculating the probability of default or credit worthiness for the borrower.

Claim 22 is written in computer software that parallel the limitations found in claim 4 above, therefore, is rejected by the same rationale.

### ***Conclusion***

9. Claims **1-24** are rejected:

10. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure:

Eder (US 6,393,406) discloses an automated system and method for measuring the performance of elements of a business enterprise.

Fletcher et al. (US 6,112,190) disclose method and system for commercial credit analysis.

Norris (US 5,870,721) discloses system and method for real time loan approval.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Nga B. Nguyen whose telephone number is

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(703) 306-2901. The examiner can normally be reached on Monday-Thursday from 9:00AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on (703) 308-0505.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 306-1113.

12. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

C/o Technology Center 3600

Washington, DC 20231

Or faxed to:

(703) 872-9326 (for formal communication intended for entry),

or

(703) 308-3691 (for informal or draft communication, please label "PROPOSED" or "DRAFT").

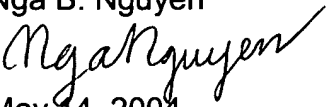
Hand-delivered responses should be brought to Crystal Park 5, 2451 Crystal Drive, Arlington, VA, Seventh Floor (Receptionist).

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Nga B. Nguyen



May 14, 2004